

silicide, wherein a second portion of the metal layer does not contact the substrate and remains unreacted; and

B1 a metal silicide adhesion layer formed on an upper surface of the second portion of the metal layer, wherein the metal silicide adhesion layer adheres the second portion of the metal layer to a metal nitride layer that is subsequently formed on the first and second portions of the metal layer.

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14. (Amended) A high aspect ratio contact structure formed over a junction region in a silicon substrate, comprising:

an insulating layer, wherein the insulating layer defines a contact opening, wherein the contact opening is formed over the junction regions of the substrate and exposes a portion of the substrate;

B2 a titanium layer formed in and adjacent the contact opening, wherein a first portion of the titanium layer is formed on the insulating layer and a second portion of the titanium layer is formed on the exposed portion of the substrate, wherein at least a portion of the second portion of the titanium layer contacts the exposed substrate and reacts with the silicon in the substrate to form titanium silicide, wherein the first portion of the titanium layer does not contact the substrate;

a titanium silicide adhesion layer formed on an upper surface of the first and second portions of the titanium layer;

a titanium nitride contact fill formed in and adjacent the opening, wherein the titanium nitride is formed on an upper surface of the titanium silicide adhesion layer, wherein the titanium nitride contact fill is adhered to the first portion of the titanium layer by the titanium silicide adhesion layer.

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